

SCIENCE & GOVERNMENT REPORT

11th Year of Publication

The Independent Bulletin of Science Policy

Volume XI, No. 4

P.O. Box 6226A, Washington, D.C. 20015

March 1, 1981

Economic Plan Calls for Big Cuts in Research

The following are the major research-related items from America's New Beginning: A Program for Economic Recovery, the plan issued February 18 by the Reagan Administration for cannibalizing the federal budget to provide more money for military purposes.

National Science Foundation: The numeration regarding NSF is somewhat opaque, but the intent is clear—to focus the Foundation on big payoff hard science and reduce its presence in such fringe areas as the social sciences, spread-the-understanding programs, and the academic-industrial collaboration due to the previous Administration.

New Beginning says that "reduction or elimination"

The Non-Existent Trumpet

Where's the counterattack to the Reagan Administration's bloodletting plan for science?

The answer is that there isn't any, and it's difficult to see how one can be quickly assembled, given the flabby political condition of the scientific community.

There is no figure at present on the national scene who commands public attention as a spokesman for science, with the exception, perhaps, of a few of science's TV celebrities. But in terms of honored savant, the cupboard is bare. In Washington, the presumed eminence of science is the President of the National Academy of Sciences, Philip Handler, but in addition to being a lame duck, he's the only one in the capital who believes that he's a great mover and shaker in science and government affairs. The American Association for the Advancement of Science has the numbers and resources to tell the country that Reagan is eviscerating a vital national resource just to save a few bucks, but the AAAS has never been noted for combativeness. Its top hired man, Executive Officer William D. Carey, graces the February 27 issue of *Science* with an on-the-one-hand, on-the-other-hand editorial that safely observes, "Whether research budgets will be treated too roughly, relative to everything else, remains to be seen."

The reason there isn't a trumpet call to arms within the scientific community is that after many comfortable years, none of the mandarins knows how to trumpet.

are to be the fate of "programs that are narrowly focused or of less priority such as the 2-4 year college instrumentation grants, the small business innovation research program, and the intergovernmental and international science programs; and other programs in science and engineering education and the behavioral, social, and economic sciences, which are less critical to meeting the goals and objectives of the Foundation."

Decision is "deferred" on whether to proceed with pending new programs inherited from the Carter Administration. These include the \$75 million budgeted for research equipment and modernization in university laboratories and \$9.8 million for detailed design and initial construction of a 25-meter telescope planned for Mauna Kea, Hawaii. (Due for completion in 1984, the total cost is listed at \$29.3 million).

Throwing a sop to the relationship between research and the economy, the Reagan plan says that the proposed cuts will not touch "the previously proposed level of support for basic and applied research in the mathematical and physical sciences, engineering, and

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In Brief

Still no word from the White House on the fate of the Office of Science and Technology Policy; there's also silence on a choice for Presidential science adviser.

Indications are that Mr. Reagan will make use of a science advisor and a science-advisory office, but it's looking increasingly doubtful that he'll simply carry on with the staff organization that he inherited from the Carter Administration. One possibility is that science advice will be integrated into the Office of Management and Budget. Another, considered possible, but unlikely, is that the whole setup will be relocated in the Department of Commerce.

Meanwhile, with the advisory post vacant, the targeted victims of OMB Chief Stockman's R&D budget cuts have no place to turn but Congress. There's not much help to be had there for the present, however, since Capitol Hill is cautiously assessing public reaction to the Reagan economic plan.

The biggest science booster in the Senate is Harrison Schmitt (R-NM), the former astronaut, but he's also sought to identify himself as a Reaganite economic conservative and it's difficult for him to contend that science should be exempted from spending cuts.

...Space Agency Hit by \$300-Million Cut

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the astronomical, atmospheric, earth, and ocean sciences. These have not been reduced because research in the natural sciences and engineering is of relatively high importance to future technological advancement and the long-term economic health of the nation."

NSF FUNDING SHIFTS

(in millions of dollars)

	1981	1982	1983
Current base:			
Budget authority	1,083	1,181	1,283
Outlays	1,007	1,041	1,155
Policy reduction:			
Budget authority	-63	-66	-90
Outlays	-26	-15	-81
Proposed budget:			
Budget authority	1,020	1,115	1,193
Outlays	981	1,026	1,074

NASA: The Carter Administration sought to give the Shuttle-burdened space agency some financial relief by budgeting it for a 21-per-cent increase in Fiscal 1982. But Reagan, who was non-committal on space throughout the election campaign, isn't going along with that space rescue mission. The "sharp increase," says *New Beginning*, "is incompatible with a program of across-the-board restraint." So, instead of the \$6.5 billion sought by Carter, the new Administration is budgeting NASA for \$6.2 billion—an increase over the 1981 figure, but about \$300 million under the Carter plan.

The financially ravenous Shuttle will continue to get all its needs, while many other parts of the space program are consigned short rations—a ground-losing 2.9-per-cent growth overall—or put into the "deferred" limbo, which does not look like a healthy place. The plan says that "Support is provided to fully utilize spacecraft launched in previous years that are still transmitting useful data (e.g., the Voyager mission to Saturn and beyond). The budget allows for continued development of those projects that offer the broadest potential scientific contribution and that have

large past investments. Specifically, full support is allowed for the further development of the space telescope. . . . An orderly progression. . . will be maintained through the development of a planetary project, such as the Galileo mission to Jupiter. US participation 1981 figure, but about \$300 million under the Carter plan.

"However," continues the plan, "the adjusted budget also assumes deferral of new and ongoing projects, such as the gamma ray observatory spacecraft, the Venus orbiting imaging radar project, and spacelab experiments, for which the potential scientific contribution is more narrowly focused and only relatively small past investments have been made."

For space, the "New Beginning" then turns increasingly sour as the plan announces that most of the new space application programs planned for 1982 "would be deleted and reductions would be made in ongoing activities, some of which unnecessarily subsidize or compete with the private sector." Without specifying the deletions, the plan proposes reduced support for remote sensing of value for Earth resources research, programs "related to understanding weather and climate; and research on advanced space communications technology needed to increase the useful range of radio frequencies for communications." The reduced level would be 6 per cent above the 1981 budget, which, again, is an inflationary loser.

NASA FUNDING SHIFTS

(in millions of dollars)

	1981	1982	1983
Current base:			
Budget authority	5,534	6,565	6,795
Outlays	5,283	6,273	6,642
Policy reduction:			
Budget authority	-75	-330	-248
Outlays	-60	-241	-334
Proposed budget			
Budget authority	5,459	6,235	6,547
Outlays	5,223	6,032	6,308

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ISSN 0048-9581

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Independently published by Science & Government Report, Inc., twice monthly, except once each in January, June & July. Annual Subscription: Institutions, \$118.50 (two years, \$198.50); individuals, \$48.50 (two years, \$82.50). Editorial offices at 3736 Kanawha St., N.W., Washington, DC 20015. Tel. (202) 244-4135. Second class postage paid at Washington, DC. Please address all subscription correspondence to Box 6226A, Northwest Station, Washington, DC 20015. Reproduction without permission is prohibited. SGR is available on Xerox University Microfilms. Claims for missing back issues will be filled without charge if made within six months of publication date.

...NIH, Solar Research Also Take Losses

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NIH: Biomedical research, a political favorite in all seasons, fares relatively well in the Reagan budget revisions, but only in terms of slipping backwards slower than the rest of the non-military research organizations. The figures are rubbery, because Carter restrained his budget request for NIH in anticipation of the usual Congressional generosity for Bethesda. The Reagan Administration, proceeding with the tight NIH budget proposal that it inherited from Carter, cagily proclaims that in accordance with its "commitment to Federal support of essential biomedical research activities, funding increases will be proposed for continued growth of" NIH. "This funding will allow continuation of previous years' commitments and permit substantial numbers of new awards each year." The downside news is that "to achieve economies and reduce lower priority activities... the funding increases will not fully cover projected inflation. Real reductions below the current base will be made across all NIH institutes."

There are no explicit details about the reductions, except for the statement that "One of the principal areas of reduction will be the institutional payments made for NIH (and other) research training under the National Research Service awards. This proposal would eliminate the current practice of paying more to an institution for a Federally supported trainee than is charged in tuition and fees to non-federally supported students at the same institution. All trainees would continue to receive awards for their tuition, fees, and living expenses."

As for the details of financial ups and downs, here, too, they're skimpy and invite skepticism, since the last Congress never finished its work on the NIH budget for the fiscal year that we're now in; instead, it simply passed a continuing resolution, which means that NIH is to carry on as it did in the previous fiscal year, with some minor exceptions. In any case, the Reagan plan says that "For 1981, the Administration will request budget authority reductions totaling \$126 million below the NIH current base but still allowing a \$89

million increase over the 1980 level. For 1982, a further increase of \$246 billion in budget authority will be requested.

What does that mean? NIH's money managers frankly concede that they don't have the slightest idea.

NIH FUNDING SHIFTS

(in millions of dollars)

	1981	1982	1983
Current base:			
Budget authority	3,644	3,961	4,250
Outlays	3,432	3,731	4,003
Policy reduction:			
Budget authority	-126	-197	-373
Outlays	-54	-145	-336
Proposed budget:			
Budget authority	3,518	3,764	3,877
Outlays	3,378	3,586	3,667

Other Programs: The new Administration has decreed a total wipe out for one of the proudest achievements of the Carter Science Office, the laboriously assembled, but as yet uninitiated, **Cooperative Automotive Research Program**. Conceived by Carter's Science Adviser, Frank Press, the program was intended to promote collaboration on automotive research problems among academic, industrial, and government researchers, starting with an outlay of \$6 million this year and rising to \$15 in 1986. Several of Reagan's transition science advisers regarded it, however, as an amateurish recipe for what ails innovation in the auto industry, and the plan seems to reflect that viewpoint when it states: "The automobile companies rather than the federal government are in the best position to decide what kind of research to undertake and when to do so. Given other demands on its resources, Federal financing of long-term research to benefit a particular industry is an inappropriate allocation of Federal funds."

A 50-per-cent reduction is proposed for the federal **Sea Grant College Program**, which the plan concludes is "primarily of local, State, or regional benefit and can be conducted without" funding from the National Oceanic and Atmospheric Administration. In addition, development of the **National Ocean Satellite System** is "deferred," with savings over seven years estimated at \$900 million.

Proceeding down the list, there's a 50-per-cent cut for the **Arts and Humanities Endowments**, a 25-per-cent cut next year for the **National Institute of Education** (plus elimination of a \$5-million supplemental proposed by

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Hopkins Honors Frank Press

Frank Press, White House Science Advisor during the Carter Administration, was awarded an honorary degree by Johns Hopkins University February 23 at ceremonies marking the 105th anniversary of the university. Since leaving the government, Press has temporarily returned to teaching at MIT prior to assuming the presidency of the National Academy of Sciences in July.

Budget Analysts Puzzled by Reagan's Numbers

The shrunken budget that Mr. Reagan triumphantly presented February 18 has achieved its intended effect of producing deep political shock. But, as old hands in the Washington research community, in and out of government, pore over the details, what's becoming evident is that the new budget is a slap-dash production that is frequently in conflict with the new Administration's own claims.

What troubles many budget analysts about Mr. Reagan's requests is not that they are lower than had been expected, which they are, but that they are presented in a haphazard and confused way. Meaningful comparisons between the new figures, the Carter figures, and earlier Congressional appropriations simply cannot be made, the analysts complain.

"It would be like comparing apples and oranges and peanuts," said one budget analyst at NIH. "And yet people up on the Hill want and need to make those kind of comparisons, if they are going to make intelligent decisions about these requests."

A budget official at NSF said that he recognized that President Reagan wanted to present his budget in "the best light. Every President wants to do that, but the fact is, this budget won't make much sense to anybody. It

makes certain economic assumptions that will make it very hard for Congress to decipher."

The February 18 budget documents carefully avoid any comparisons with the Carter proposals and actual spending ceilings set by Congress in appropriations for the present fiscal year, 1981. Instead, the proposed Reagan figures are contrasted with what one budget analyst called a "fictional set of figures, a kind of wish list of economic assumptions about what would have been spent, given what Reagan's budget people believe the economic conditions will be."

For NSF, for example, the Reagan budget calls for a reduction in budget authority of \$66 million in fiscal 1982, which begins next October 1. Yet it is unclear from what the \$66 million is being cut. When the Reagan figures are compared with the actual Carter proposals, the drop is actually \$241 million. And when they are compared with actual fiscal 1981 appropriations, the Reagan requests represent a drop of \$35 million.

Equally confusing is NSF's 1981 budget, which Reagan budgeteers said they would like to reduce by \$63 million. What they did not say, however, is in what form that savings should come. Will they be in a request to Congress for a rescission for the current fiscal year? No answer was offered.

What is clear and what troubles many university researchers is the number of specific areas that Mr. Reagan has said are dispensable in the 1982 budget.

If the Reagan White House has its way, all areas of social and behavioral sciences, economics, and science education will be reduced substantially in the coming fiscal year—a proposal that is already meeting bitter opposition from lobbyists in Washington who are now preparing testimony for Congressional hearings.

Strong opposition also has been voiced against proposed cuts in programs that the Reagan Administration believes are "narrowly focused" and those that are not "critical to meeting the goals and objectives of the Foundation." These include international research projects and efforts to help two- and four-year colleges improve their research facilities.

To the disappointment of many campus officials, the Reagan Administration also would defer "for further consideration" all new programs proposed by the Carter Administration, including a \$75-million effort to modernize university laboratories.

"It is a foolish proposal," said one university lobbyist. "To give researchers grants but refuse to give them the equipment they need to carry out their work, is like giving a fisherman a boat to go fishing but refusing to give him a fishing pole to catch the fish."

NIH would be slightly better off, under the Reagan

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BUDGET CUTS *(Continued from page 3)*

Carter), and deferral of a permanent facility for the **Solar Energy Research Institute**. Solar research will, in general, be severely cut, the rationale being that the private sector can now make money in the solar market and ought to foot the costs. Thus, Reagan calls for cutting some \$363 million from the \$583-million solar budget that Carter proposed for 1982. The plan says that federal support will be available for "advanced research concepts and exploratory development," but little else in the solar field.

Finally, the **Department of Energy's General Science Programs** will have to parcel out a \$40-million reduction among its areas of support, which are in the life sciences, nuclear medicine, high-energy and nuclear physics. The budget from which this will come was set by Carter for \$602 million for next fiscal year—and that elicited cries of pain from the people in the field. The plan says a few kind words about "the importance of basic research...as an investment in the Nation's future," and then announces "a temporary stretchout of new construction, a general decrease in operating level and utilization, a general reduction in the level of experimentation for medium-energy nuclear physics, nuclear medicine and life sciences, and deferrals of new accelerator construction at universities."—DSG

Academe Ponders Defense Curbs on Research

Recent attempts by the National Security Agency (NSA) to take control of aspects of university-based cryptography research considered of value to a potential enemy have sparked a growing debate on campuses about the implications of the military's renewed interest in basic research.

In the case of unbreakable codes, a study group set up by the American Council on Education, largely at the suggestion of the NSA, has recently agreed to recommend that scientists and journal editors voluntarily submit research papers to the agency prior to publication, in case they contain anything which the agency would like kept secret. But criticism is already being voiced that such self-censorship may prove unacceptable to some members of the scientific community, setting a precedent by which the military could invoke restrictions on any area of research which it felt it might be able to use profitably.

One area of basic research in which universities are now receiving considerable support from the Department of Defense—and which is giving rise to such concerns—is the field of very high-speed integrated circuits (VHSIC), which are in heavy demand as the electronic brains of future weapons and military equipment. A major expansion in VHSIC research was approved by Congress two years ago, and research is now being sponsored at a number of major universities, including Stanford, Caltech, and MIT.

In attracting university bids for research contracts, DoD has stressed that the basic research sponsored under the VHSIC program is unclassified, and can be freely published. However, given concerns that some of the results from such research could assist others in developing VHSIC technology—and the existence of what Defense officials describe as a “grey area” separating basic research on, for example, the property of materials from ideas about how to improve on sub-micron geometries used in microcircuit design—the Department has issued new guidelines. These state that it would “prefer” that foreign research students were not used on such projects. Where this preference cannot be accommodated, it says, then the VHSIC program office will make a decision about whether the foreign student can be involved, based on the nature of the research.

The controls are being exercised under the International Traffic in Arms Regulations (ITAR), introduced by Congress in 1972 as a means of protecting the export of technology and technical data of potential military value, even where such technology and data are unclassified. Under the terms of ITAR, which are currently being tightened up by the State Department as described in the *Federal Register* of last December 19, an export permit must be obtained for the exports. The wording is broad, covering any technical develop-
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REACTION *(Continued from page 4)*

proposals, but even there the picture is fuzzy and troubling for the biomedical community. The President said that his \$3.764-billion budget for fiscal 1982 should be compared to a fiscal 1981 budget of \$3.644 billion. Yet Congress actually appropriated \$3.594 billion for the current fiscal year.

The budget documents also show that the Reagan Administration will request a budget rescission in the current fiscal year of \$126 million below the so-called current base, yet the current base figure is \$50 million above actual appropriations. That particular discrepancy may be explained by the fact that Carter had proposed rescinding nearly \$50 million in NIH's budget—a cut that has not yet shown up in the actual spending levels. Whatever the actual figures may be, the Reagan Administration said its proposals are not designed to keep pace with inflation.

The biggest blow to medical schools in the Reagan budget is the proposal to reduce institutional or overhead payments made to train biomedical researchers under the National Research Awards program.

Students attending medical school would also feel the pinch of the Reagan cuts. Arguing that personnel shortages will largely be eliminated in most fields of the medical profession, the Administration said it would focus its support on medical specialties, such as nursing, where shortages persist.

The Administration also has made its intent clear to cut other areas of research far below the level President Carter has proposed. Spending would be slowed in NASA, the National Oceanic and Atmospheric Administration, and the Department of Energy.

The White House says it will clear up all questions about just how deep the proposed cuts will be when it releases the final details of the budget March 10. But after the intentions are spelled out, there's still the Congress to deal with. At present, it's the White House and its shrewd new occupant that are dominating the news while the Congress quietly looks for signals from electorate. But as the meaning of the Reagan budget sinks in, and various affected constituencies mobilize for a response, what will become apparent is that it's easy to propose budget cuts, but very hard to cut the budget.—AR

...Threat Seen in Use of Export Restrictions

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ments which might contribute to the "state of the art" of US military technology. And they are written in such a way that even discussing details of the results of scientific research which could lead directly to improvements in this technology with a foreign national—for example a visiting scientist or a foreign research student—could require prior approval.

It was the ITAR controls which were invoked three years ago by the NSA to hold up a patent application which had been filed by a computer scientist at the Georgia Institute of Technology, George Davida. Although the research itself leading to Davida's "data encryption standard" was unclassified, when he applied for a patent that application was checked with the agency—which immediately sent a letter to Davida warning him that his results were now considered classified, and that he should not talk about them to anyone, including fellow scientists.

This use of the ITAR legislation, which previously had been little noticed, set off a major debate in universities. In a memorandum to Frank Press in the Office of Science and Technology Policy (OSTP), the Office of the Legal Counsel of the Department of Justice wrote that "it is our view that the existing provisions of the ITAR are unconstitutional insofar as they establish a prior restraint on disclosure of cryptographic ideas and information developed by scientists and mathematicians in the private sector."

This opinion was not made public by Press at the time, on the grounds that it was predecisional legal advice not releasable by the government; it was published for the first time last year in the record of hearings held by the House Government Operations Committee.

The debate on the constitutionality of ITAR is still open. In 1978 a company exporting rocket and missile components, Elder Industries, was convicted for exporting technical data without a license, and failed to convince the Ninth Circuit Court that such information was covered by the first amendment. The Justice Department, however, subsequently told the OSTP that given the military details in the data, it did not consider this to resolve the constitutionality issue. And one of the main recommendations of the House committee, in its report "The Government's Classification of Private Ideas" issued just before last Christmas (House Report 96-1540), is that, in the light of the Justice Department's opinions, the ITAR should be reviewed and rewritten "to satisfy constitutional objections."

In areas of basic research directly financed by the Department of Defense, there is little disagreement that

whatever the present ambiguities in its wording—some of which the State Department hopes will be cleared up in its draft revisions—ITAR does in fact apply. When Congress authorized the multi-million dollar VHSIC program in the 1980 defense authorization bill, it stated explicitly that the research should be conducted under ITAR controls.

Officials in the Department say that they are bending over backwards to interpret the regulations as flexibly as they can. Some of the research involved, they say, can be obviously classified as "process improvements," and is therefore subject to controls that include a restriction on open publication and dissemination of the results, which has itself concerned some of the private companies carrying out this research, since they could be prevented from communicating the results even of related research programs to their overseas affiliates. At the other end of the spectrum, the Pentagon says that the basic research carried out under the program with no particular application in mind will not have the ITAR rules applied.

The problem comes with the grey area in the middle, dividing the basic research from the applied. Given the uncertainty over precisely where the dividing line comes, the Defense Department has decided to follow the advice proposed to former Defense Secretary Harold Brown by the Defense Science Board, and states its "preference" that foreign research students are not used for such research projects, although indicating a willingness to review individual projects on a case-by-case basis.

The Department feels that this arrangement should minimize any restraint on the flexibility of research universities to submit research proposals in the VHSIC field. Some of the universities themselves are less certain, since in many the proportion of computer-science research students who come from abroad is over 50 per cent. "Theoretically it would be possible for government officials to close down most current semiconductor research in universities, since if they are doing their work properly it should certainly be 'state of the art,' " according to one university administrator.

The main question seems to be how rigidly the Department of Defense and the State Department are likely to interpret the ITAR rules. Considerable embarrassment was caused last year when the overzealous interpretation of export-control regulations by federal officials led to Eastern European scientists being excluded from two open scientific meetings, one on inertial confinement fusion and the other on bubble memories. After that, Press made it known that open

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...The "Concord Syndrome" Stirs Concern

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components. Telematics will consume more than 30 percent of the production of integrated circuits. It is to this end of industrial politics that Gerard Thery pushes the "telematization of French society" and heavily supports the R&D labs in solid-state physics and applied mathematics.

The policy to "pull" the electronics industry by public demand invented by bureaucrats is not new in France, but it attracts more and more distrust among members of Parliament, many of whom recall the financially disastrous "Concord syndrome." Since one can no longer conceal that the supersonic transport is a commercial failure, all technological innovation coming from government is considered suspect. A wave of criticism and doubt has therefore unfurled on the third DGT experimental operation: The wiring of a network of picturephones connected by optical fibers to Biarritz, a small town at the border with Spain. The network, which will allow the connecting of 1500 subscribers to picturephones during a first phase, and 5000 afterwards, is the largest distribution network project using optical fibers in the world. It will be expensive: \$100 million is being put forward. This is far from the cost of the Concord, but it adds to the arguments of the lobby of the regional press.

RESTRICTIONS (Continued from page 6)

meetings are not considered to fall under export controls, even if "technical data" is conveyed to foreign scientists. It is a different matter for closed meetings, at which attendance is limited, the discussion frank and open, and the proceedings are not published. These are still considered potentially applicable to a rule requiring prior approval by the State or Commerce Department—which could effect meetings such as the Gordon conferences.

The potential implications of the ITAR were discussed by university administrators and government officials at a meeting organized in Washington last week by the Association of American Universities. The AAU has already distributed the Defense Department guidelines on VHSIC research to its member universities, and is awaiting the reaction. Many, remembering the fierce anti-war demonstrations of the 1960s, and having agreed to ban classified research from their campuses, are wary about what they may be letting themselves in for. But faced with the prospect of diminishing funds from other sources, many are keen not to reject the Pentagon's proposals as being unreasonable.—David Dickson, Washington news editor, *Nature*

In the case of the Biarritz operation there is the paradox of certain firms in the operation which are participating against their will. One can imagine that they are not displeased by the creation of an anti-telematics lobby. They do not appreciate this disruption of their own R&D programs and even less their international accords. In recent years, the Labor Department has forced ITT to abandon a large part of its activities in telecommunications in France. It has forced Corning Glass to take contracts in France. It has also introduced competition among French makers of integrated circuits, all of whom are licensees of American firms. But above all, even though it is difficult to obtain figures, it seems that the government has pushed the firms to do perhaps twice as much R&D as they wanted to. The push did not occur without a reorganization of the firms or without changes in personnel. A lot of bitterness has resulted.

One of the principal supports—indirect—to this policy comes from the field of teaching. This is another paradox, since "national education" and the teachers union are generally conservative in France. But they have decided to support the introduction of computers in the schools. In October, an eminent professor in data processing from the University of Paris—Jean Claude Simon—gave a report to President Giscard d'Estaing which made 21 proposals, of which the most innovative called for the introduction of data processing in school at the age of 13. This means a large program for the training of professors and the purchase of equipment. One would have thought this would make teachers shudder, but Andre Henry, the Secretary General of the powerful Federation for National Education (the FEN is a "leftist" union) declared without any hedging: "The teachers missed the audiovisual revolution 20 years ago...it would be suicidal to negate the processing one." It must be understood, however, that the Communist branch of the union demands "guarantees," that is that nothing will be subcontracted to the private sector. Under these conditions, the Secretariat of State of the PTT becomes a powerful silent partner.

Meanwhile, steps for the appointment of professors at universities to educate data-processing engineers have already been taken. The Data Processing Agency, a governmental agency created to promote the utilization of data-processing wherever possible, is about to release \$10 million to educate an additional 600 data-processing engineers per year and the Agency is well assisted by the PTT in this.

In view of all this well-financed activity by an agency that is a power unto itself, it is not difficult to understand the unease generated by telecommunications' big, and growing, power in French R&D, as well as in cultural and economic affairs.—FS

France: Booming Role for "Telematics" R&D

Paris. Research and development related to telecommunications is emerging as a highly prosperous sector in an otherwise flat French R&D economy.

Within the French scale of things, the sums for telecommunications are enormous—with about \$600 million currently budgeted for R&D. This makes the General Directorate of Telecommunications (a branch of the Secretariat of State for Post, Telegrams and Telephones—PTT) one of the main investors in R&D, together with the Armed Forces and the Commission on Atomic Energy. In addition, among all the research funds which the government manages, only those of the PTT are not financed by taxes, but are the product of telephone rates, just as Bel Labs is financed by AT&T. Also, the Parliament does not have real control over the expenditures for R&D by Telecommunications. Finally, since the General Directorate of Telecommunications contracts out more than 80 percent of its R&D, its influence on public and private undertakings and laboratories is considerable.

Such manna excites the covetous. Such power concentrated in a single point releases jealousies, especially when the economic press here has taken to referring to Gerard Thery, the Director General of Telecommunications (DGT), as one of the most powerful men in France.

During the last parliamentary session a first offensive was launched by deputies of various political affiliations. Following the examination of the telecommunications budget in December, some deputies severely criticized the large projects started by the DGT. There are three large experimental ventures in "telematics" (a neologism used in France to designate the marriage between telecommunications and data processing).

The first, TELETEL, is, basically, an interactive view - data system which allows one to shop at home as well as reserve travel and theater tickets, and so forth.

The merchants of Velizy—a suburb of Paris—where the system was tried out could have felt threatened, but they are very much in favor of it.

The same cannot be said for the second experiment, which aims at replacing the telephone directory with a TV terminal screen. The Bretons were the first guinea pigs for this operation, which raised a tempest on the part of members of the Parliament. They are not fooled about the true usefulness of the "directory terminal." By the time each telephone subscriber has a terminal with a screen allowing easy access to data, it will be more convenient to circulate announcements and ads electronically than by publishing them conventionally. Because newspapers get their main source of income from ads, regional papers believe that the electronic directory will sign their death warrant, and with their disappearance will come the end of freedom of expression, because in France radio and TV are practically completely controlled by the government. The development of telematics—which, through the Secretariat of State of the PTT, is also controlled by the government—can only accelerate this centralization.

The deputies, supported by the local press, have therefore exerted all the pressure of which they are capable to interrupt this operation, but without success to date. All they have obtained is agreement to create a "surveillance committee," which includes representatives from consumer groups, journalists, and members of Parliament.

A major object of the DGT is to limit Japanese electronic imports and thus to promote French equipment. The DGT would like to make telematics the equivalent of armaments, which are perhaps France's best-selling exports. In addition, telematic equipment is an excellent booster for the consumption of sophisticated electronic

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